

ABSTRACT OF THE DISCLOSURE

A gene designated *CKB3* whose product interacts specifically with CCA1 has been identified through use of the yeast two-hybrid system. CKB3 is a structural and functional homologue of the regulatory (β) subunit of protein kinase CK2 in
5 *Arabidopsis*. Recombinant CK2 can phosphorylate CCA1 *in vitro*. Furthermore, *Arabidopsis* plant extracts contain a CK2-like activity that affects the formation of a DNA-protein complex containing CCA1. Recombinant plants that overexpress *CKB3* have been constructed. Overexpression of *CKB3* results in increased CK2 activity and resulted in shorter periods of rhythmic expression of *CCA1* and *LHY*, as
10 well as of four other circadian clock-controlled genes. This resulted a significant shortening of time to flowering under short-day conditions. This change in flowering time was not accompanied by significant phenotypic changes in morphology. Alteration of CK2 activity, particularly through the overexpression of the *CKB* represents a new and effective way of modulating flowering time in plants.

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